Sediments and GenX in The CFR

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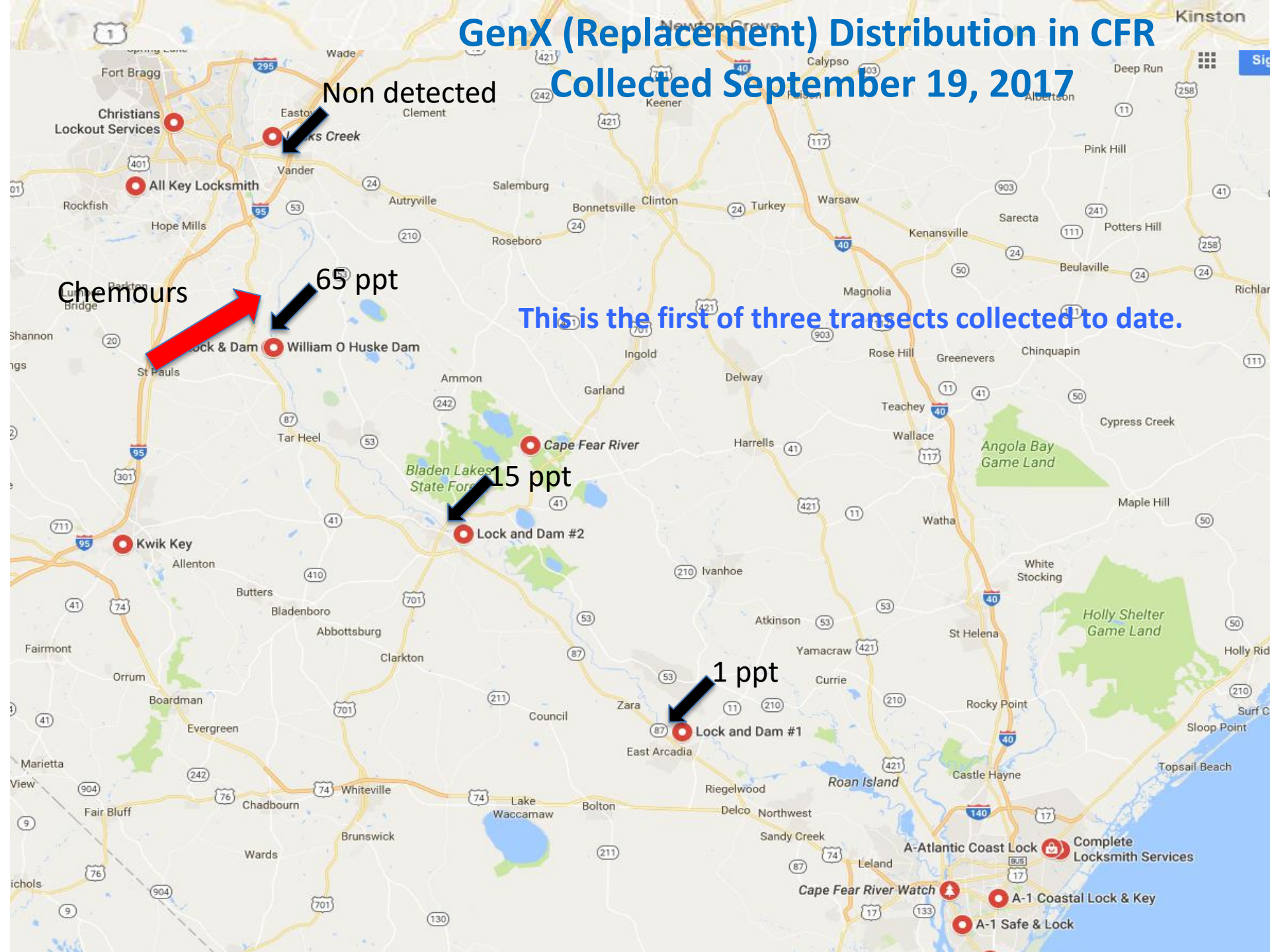
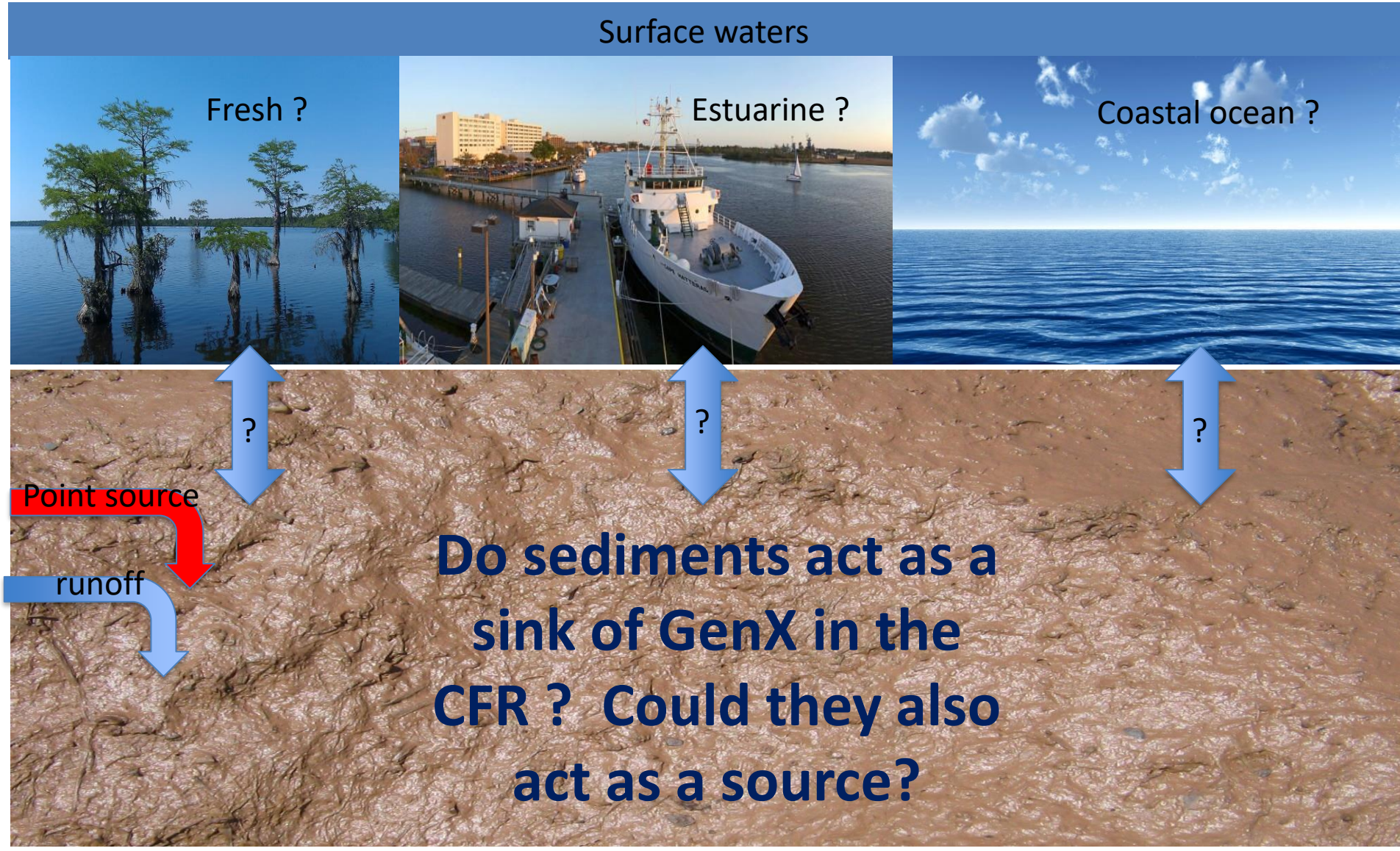
Why are we interested in sediments? GenX in water column of CFR


GenX (Replacement) Distribution in CFR
Collected September 19, 2017
Non detected
Chemours
65 ppt
15 ppt
1 ppt
This is the first of three transects collected to date.
Christians Lockout Services
All Key Locksmith
William O Huske Dam
Cape Fear River
Lock and Dam #2
Kwik Key
Lock and Dam #1
Fort Bragg
Wade
Clement
Vander
Rockfish
Hope Mills
Autryville
Salemburg
Roseboro
Bonnetsville
Clinton
Turkey
Warsaw
Kenansville
Sarecta
Potters Hill
Beulaville
Magnolia
Pink Hill
Deep Run
Kinston
Calypso
Keener
Albertson
Ingold
Rose Hill
Greenevers
Chinquapin
Delway
Ammon
Garland
Tar Heel
St Pauls
Teachey
Wallace
Harrells
Cypress Creek
Angola Bay Game Land
Maple Hill
Watha
Ivanhoe
White Stocking
Holly Shelter Game Land
St Helena
Atkinson
Yamacraw
Currie
Rocky Point
Sloop Point
Topsail Beach
Castle Hayne
Roan Island
Riegelwood
Delco
Northwest
Sandy Creek
Leland
Zara
East Arcadia
Council
Allenton
Butters
Bladenboro
Abbottsburg
Clarkton
Fairmont
Orrum
Boardman
Evergreen
Marietta
Fair Bluff
Chadbourn
Whiteville
Lake Waccamaw
Bolton
Brunswick
Wards
Ivanhoe
A-Atlantic Coast Lock
Complete Locksmith Services
Cape Fear River Watch
A-1 Coastal Lock & Key
A-1 Safe & Lock

Why did the concentrations decrease as you move down river?

Environmental Compartments that may contain GenX



Deliverables: Sediments and HB56 (Part 1)

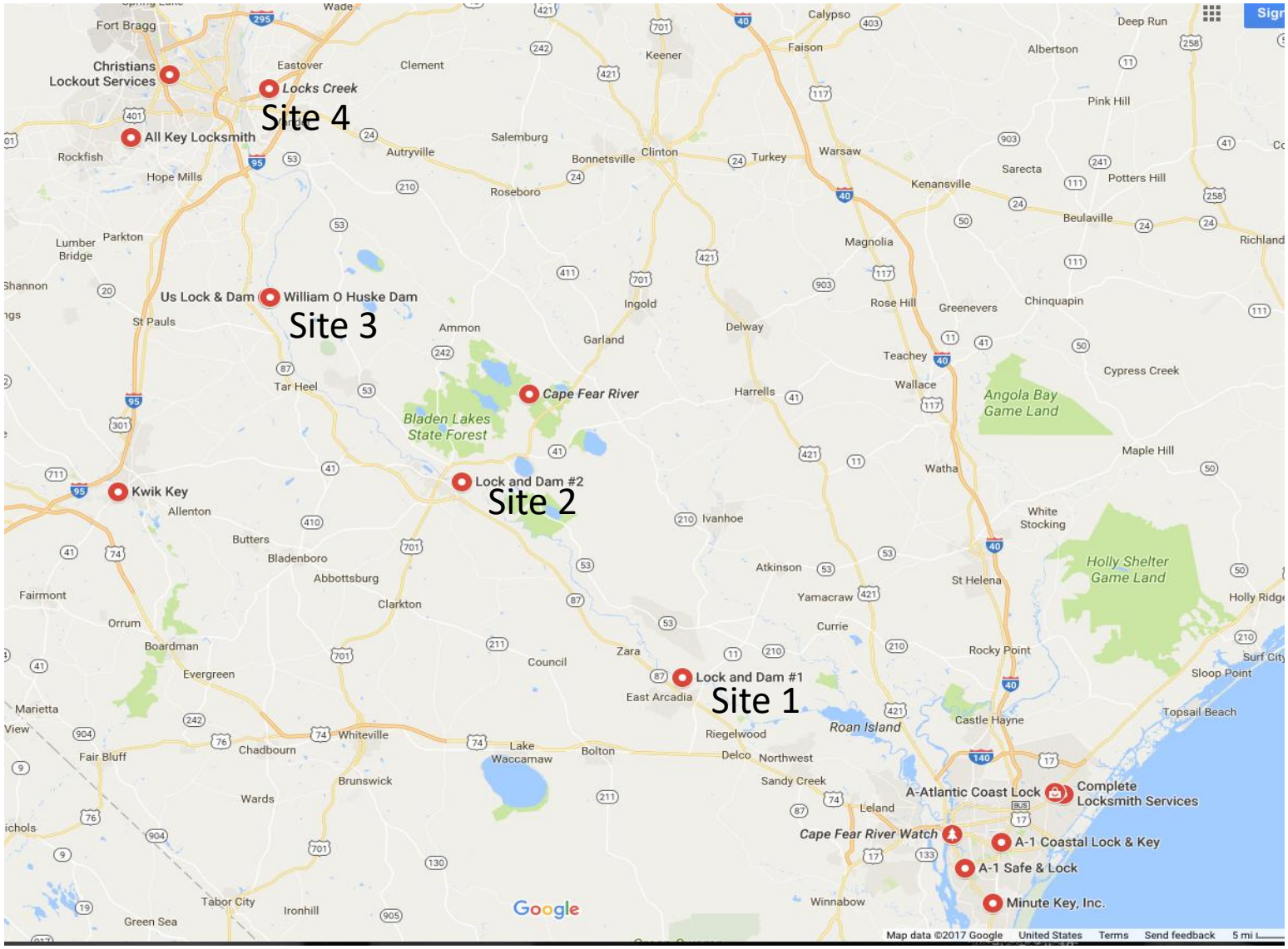
1. GenX in Cape Fear river sediments: Develop method for sedimentary analysis of GenX. Sediment samples have been collected along the river starting at Chemours facility ending at Southport.

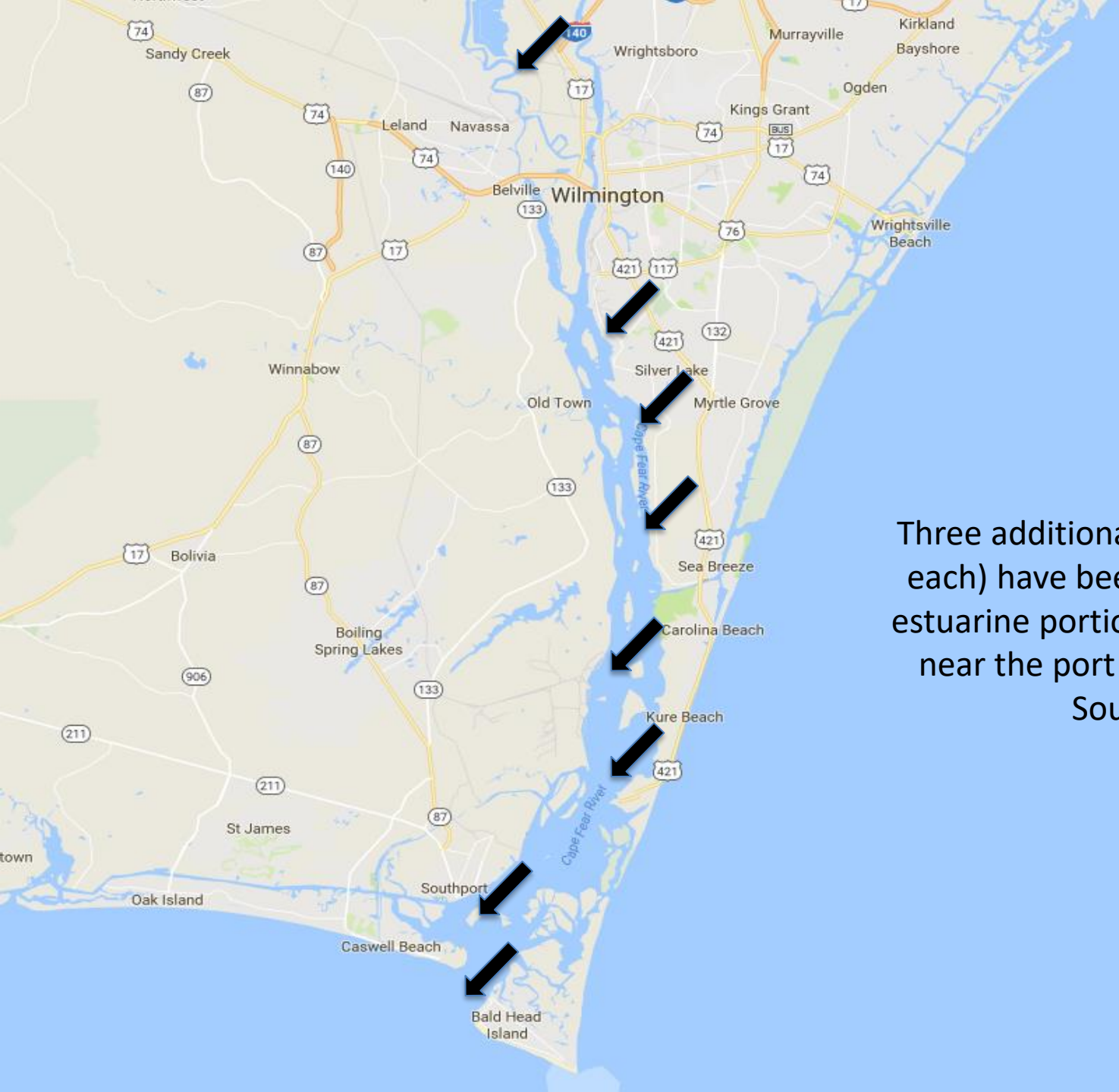
Date of Collection	Middle Cape Fear River	Lower Cape Fear River
9/11/17		X
9/19/17	X	
10/23/17		X
11/2/17	X	
1/30/18	X	
2/6/18		X

Timeline: method development has been ongoing since December when funds became available at UNCW. Sediment collection and analysis of GenX are currently ahead of schedule for this phase of the research.

First task: GenX in Cape Fear river sediments

Three sediment transects (4 sites each) have been conducted in order to examine temporal variability of Gen X in sediments





Three additional transects (8 sites each) have been collected in the estuarine portion of the river from near the port of Wilmington to Southport

Method Development

Method development for sediment analysis of GenX began in December 2017. This phase of the project is nearly complete.

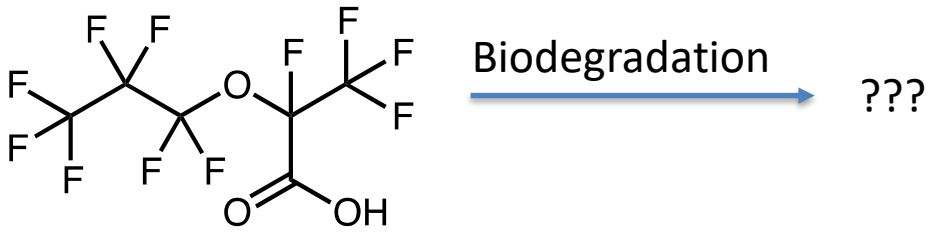
Efforts have focused on microwave (Munoz et al. 2017) and sonication (White et al. 2015) in the presence of methanol to extract GenX from sediments.

Current results suggest sonication is the most effective extraction strategy.

Now that the method development is nearly complete, analysis of the sediment transects will begin. Additional transects will be collected during summer and fall to explore seasonal variability.

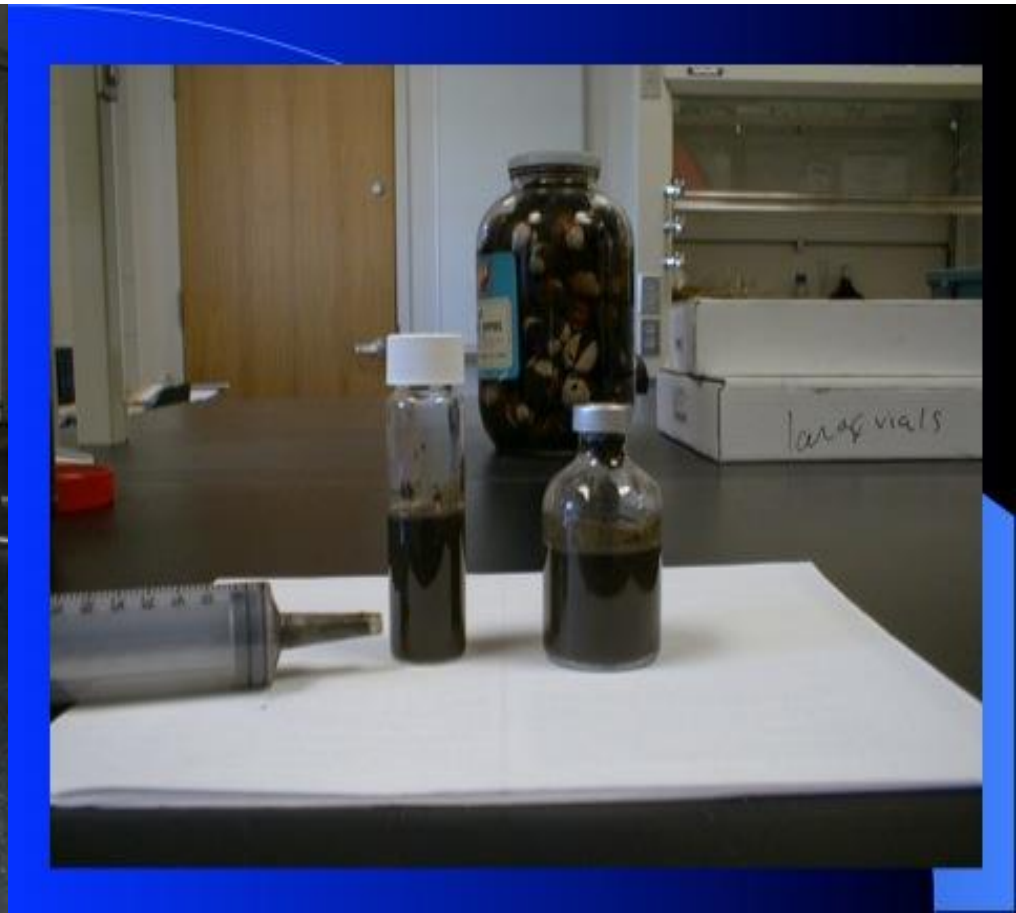
Deliverables: Sediments and HB56 (Part 2)

2. Genx Biodegradation Study: Fresh sediments will be collected for biotic degradation studies of GenX.



Timeline: Sediments will be collected and incubated for time series experiments lasting up to one year

Biodegradation studies: Sediments spiked with GenX and the concentration monitored as a function of time. Transformation products will be identified if present as well. Incubations will be carried out for up to one year.

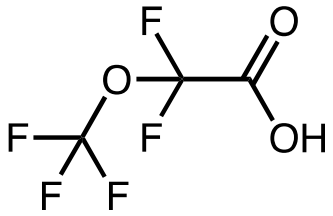


Acknowledgements

- HB56
- Department of Chemistry and Biochemistry
- UNCW (College of Arts and Sciences) and Sponsored Programs and Research Compliance)

Ancillary Deliverables

- Authentic Standard of PFMOAA has been obtained



- GenX is present in precipitation collected at NSF funded UNCW collection station
- Continued collection of raw and finished drinking water at CFPUA for PFECA and other no targeted compounds